TERRORISM AND THE EMERGENCY MANAGEMENT PERSPECTIVE:
WEAPONS OF MASS DESTRUCTION SITE SURVEY

EXECUTIVE LEADERSHIP

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ABSTRACT

This research project analyzed the factors that make up a weapons of mass destruction site survey. The problem was that the Orlando Fire Department does not provide for the assessment of the threat against critical facilities and systems within our community. The purpose of the research project was to develop a Weapons of Mass Destruction Site Survey form to assist in identify potential terrorist target locations.

The research employed action research (a) to determine what items should be included in the Weapons of Mass Destruction Site Survey, (b) what are the different types of weapons of mass destruction, (c) what is the best model to use for developing contingency plans for WMD events, (d) what are the obstacles to effective WMD readiness, (e) what can be done to effectively deter a terrorist organization from targeting a facility or structure within a community?

The principle procedure employed was review of published materials and a survey of 100 local and national fire departments depicting their assessment of the terrorist threat against critical facilities and systems in their community. Data was compiled in graphic form to facilitate a comparison of published materials and contemporary fire department applications of assessing the terrorist threat.

The major findings of this research were that few fire departments currently incorporate a weapons of mass destruction site survey into their preplanning operations. Principle among those factors was that only 9% of surveyed departments even have a formal process in place for evaluating the weapons of mass destruction potential to critical facilities within their communities.

The recommendations resulting from this research include (a) train all Orlando Fire Department company officers on the use of the weapons of mass destruction site survey, (b) update this form to keep it up with contemporary research on weapons of mass destruction potentials, and (c) gain a larger consensus from the fire service community insofar as what weight factors are appropriate for scoring the weapons of mass destruction site survey guideline.

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INTRODUCTION

The Orlando Fire Department has a history of over one hundred years of service

excellence to the citizens of the city of Orlando. In the late 1950's, the fire

department recognized the advantage of training its personnel in the dual role of

both firefighter and emergency medical service provider. Starting with this cross

training, the department has evolved from a single tasked fire fighting department

into a premier, multiple rolled organization. Currently the Orlando Fire Department

(OFD) provides fire fighting services, Advanced Life Support (ALS), Basic Life Support

(BLS), a Dive Rescue team, a Hazardous Materials Response team, a High Angle Rescue

team, Below Grade/Confined Space Rescue, and an Arson-Bomb Unit for the city. The

fire department currently employs 320 firefighters.

Local government has a responsibility for the safety and security of its citizens.

During and following an emergency or disaster, the continuity of government is key

to assuring this safety and security. The city of Orlando has a commitment and

obligation to its citizens, mandated by law, to ensure that mitigation efforts are

enhanced; preparedness is encouraged; responsiveness is assured; and recovery is

achieved, effectively and efficiently, before, during, and after man-made and natural

disasters. As part of the response effort emergency workers (i.e., firefighters, police

officers, private medical transporting agency personnel, nurses, and doctors) are

going to come into close contact with the victims of the a terrorist event. The effects

of the devastation that the terrorist brings to the community, will in all likelihood,

cause great emotional stress to all involved. Additionally, the emergency workers

that are charged with the task of search and recovery, extrication, medical treatment,

and transportation to a receiving facility are going to become victims of this very same terror. The Orlando Fire Department has been charged by the mayor's office to fulfill the Emergency Management function for the city of Orlando. As part of this leadership role in emergency management, the fire department must ensure that the proper preparedness and mitigation efforts have taken place to minimize the loss of life and destruction of property within our community before the terrorist strikes.

Currently the Orlando Fire Department does not have a form available to a company officer that would enable him/her to perform a weapons of mass destruction site survey on critical facilities and systems within our community.

The purpose of this research project was to develop a Weapons of Mass Destruction Site Survey form that the company officer could use to assess a facilities criticality, accessibility, recoverability, vulnerability, effects on the population, and recognizability. Action research was employed to answer the following questions:

1. What items should be included in the weapons of Mass Destruction Site Survey?
2. What are the different types of weapons of mass destruction?
3. What is the best model to use for developing contingency plans for WMD events?
4. What are the obstacles to effective WMD readiness?
5. What can be done to effectively deter a terrorist organization from targeting a facility or structure within a community?

BACKGROUND AND SIGNIFICANCE

In January 2000, Orlando Fire Chief Charles B. Walker impaneled a committee to review and update the city of Orlando's Comprehensive Emergency Management Plan (CEMP). The committee consisted of individuals from the fire department's Field Operations Bureau, Planning and Resource Section, and the Emergency Management/Special Operations Section. Over the course of several meetings, there was consensus that the current CEMP did nothing to address the potential terrorist threat that exists in the community today. The decision was made to move forward to develop a weapons of mass destruction site survey form that the company officer could utilize to assess a facilities criticality, accessibility, recoverability, vulnerability, effects on the population, and recognizability.

The main problem with the current city of Orlando CEMP was that it did not contain a component relating to the assessment of possible terrorist targets in the Central Florida area. The fire service in general has a long standing tradition of responding additional alarms into an incident until they smother the situation with manpower and the problem is mitigated. However, in the insistences of a terrorist attack, deploying additional manpower into the scene without adequate intelligence, planning, and training could represent a recipe for disaster.

Therefore, it is imperative that the city of Orlando CEMP contain a component that will assist department commanders by providing them with a tool that will detail the potential threats his/her crews face when dealing with a weapons of mass destruction (WMD) event.

Insofar as the relationship to the Executive Leadership class was concerned, the

most direct link of the subject matter is found in Unit 2: Developing Self as a Leader.

A great deal of class time was spent on the virtues of our own reaction to leadership.

In our lectures and class discussions we focused on the positive attributes of

leadership and how they can make one a more effective leader. The people that are

drawn into the fire service as a career typically consider themselves impervious to the

effects of a working structure fire or a terrorist bomb. Therefore, it is the

responsibility of the future managers of the fire service to change the paradigm of the

emergency worker, to ensure that these tragic events don't have a tremendous

negative effect on our subordinates quality of life. As outlined in the module,

managers must have a detailed understanding of the barriers to change and they

must demonstrate the effective leadership required to keep his/her staff out of harms

way.

LITERATURE REVIEW

The Emergency Management Function

The emergency management model, as it pertains to terrorist events, has come

to be identified as the four-phase model. The model was conceived by the National

Governor's Association in 1979. The model was developed to quantify a multi-step

process that had been used to address the handling of events in both man-made and

natural disasters.

The model divides the emergency managements function into four distinct

phases. The first phase is mitigation. Mitigation depicts the actions that are taken to

reduce the effects of a credible health, safety, or welfare risk to the general public

(Waugh, 1990). Mitigation is exampled by activities such as preventing or lessening

the effects of a terrorist event through designing and enforcing the established building codes, security site surveys, and maintaining accurate records of hazardous materials located on the property. Past attempts at emergency management mitigation efforts generally revolved around structural and engineering improvements, which tend to be expensive solutions to existing problems. However, contemporary mitigation efforts are more typically centered around land use requirements and enhanced building codes which tend to be more cost effective.

Preparedness is the act of developing a response plan and providing emergency response training to appropriate responders. This concept can be taken a step further to include the discussions that occur before an event, both within an organization (such as a city) or between surrounding communities, in which critical response resources are identified, cataloged, and shared in times of emergency. Preparedness is viewed as disaster planning with an emphasis placed on the development and testing of community emergency response plans.

Providing emergency aid and assistance in the aftermath of disaster, reducing the probability of secondary damage, and minimizing problems that occur during the recovery mode is referred to as the Response Mode. The response mode encompass those activities that occur immediately preceding, during, and right after a terrorist event to save lives, minimize damage to property, facilitate recovery, sheltering the homeless, evacuation of threatened populations, providing public information, protecting the population from continued threats, and preserving public order (Waugh, 1990). If the mitigation and preparedness efforts were effective, the response largely consist of the implementation of the disaster plan and activation of

the terrorist response mechanism with adequate adaptation to unanticipated circumstances (Waugh, 1990).

Finally, the Recovery Mode represents those actions undertaken to provide immediate support to victims effected by the terrorist event. These activities can include providing temporary housing outside of effected areas, re-establishing public utilities, and clearing debris which should lead to regaining a small semblance of normalcy within the community (Waugh, 1990). LaPlante (1988) writes that, "the effectiveness of the recovery programs generally are determined by the severity of the event, the resources available for recovery, and the speed of the rebuilding process" (p. 221).

Preparedness and mitigation are the activities that are undertaken before the terrorist event occurs, response activities are those actions mid-disaster, and recovery is the immediate post-terrorist event phase (Waugh, 1990).

All Hazards Approach

In an attempt to coordinate and enhance effective cooperation between local, state, and Federal agencies, the Federal Emergency Management Agency (FEMA) has been a strong advocate of the all hazards approach to emergency management. There are several steps associated with the all hazards approach to emergency management. Waugh (1990) writes that,

A community should perform a hazard analysis including the identification of known hazards, the determination of the probability of a disaster, the likely intensity of the disaster, and the probable location; the assessment of potential impact on the community; the property, persons, and areas at risk; and, the

assignment of priorities based on exposures (p. 29).

A capability assessment would then be performed including the alert and warning system, emergency communications; available shelter; evacuation plans; and, the level of training and education among response personnel. The capability assessment should lead to the identification of capability shortfalls. Emergency management agencies can then go on to develop long and short term plans to increase the communities capability.

Emergency planning involving all responsible officials, not just emergency managers, would be undertaken to plan for the unique aspects of known hazards within the community. Once complete, capability standards could be compared and contrasted against current readiness status to outline needed improvements (Waugh, 1990).

Testing and updating of existing disaster plans and the servicing of equipment needs to be performed. Emergency personnel, government officials, and the public must have ongoing training to maintain a communities capability.

During the response phase of a disaster, the plan is put into action. In addition to what is reflected within the plan, the response agency must identify unanticipated consequences and adjust the response accordingly. Additionally, the response to the disaster must be evaluated to determine its effectiveness or lack thereof.

In the recovery mode the emphasis is placed upon returning vital life support systems to minimum operating level as soon as possible. The experience gained in the recovery the mode should be utilized to improve and adjust future mitigation

efforts and hazard analysis (Waugh, 1990).

Obstacles to Effective Emergency Management

The development of an effectively functioning emergency management model

to prepare for specific types of natural and man-made disasters, mitigate their

effects, provide a competent response, and recover from their devastation requires

the commitment of considerable political and economic resources. Emergency

management programs generally do not compete well for scarce fiscal resources and

for official and public recognition (Waugh, 1990). Effective emergency management

programs are also difficult to design, implement, and coordinate. The reasons for

those difficulties are numerous:

1. Emergency management is a low salience issue until a disaster occurs;

2. Emergency management programs lack a strong political constituency supporting
    effective action;

3. There is usually very strong resistance to the kinds of regulatory actions common to
    disaster mitigation and hazard reduction programs, particularly when benefits are
    difficult to document and the economic costs may be quite high, and to the kinds of
    planning necessary to achieve effective action;

4. Emergency management programs generally lack an influential administrative
    constituency to support greater professionalization of emergency managers and
    better standard-setting in the design of programs;

5. The effectiveness of emergency management policies and programs is very difficult
    to measure, but the costs are more readily apparent;

6. The technical complexity of emergency management programs often makes them difficult to sell to the public and to officials and makes it difficult to design effective programs;

7. The current political climate is more supportive of decentralized fiscal, administrative, and policy making responsibility than it is of a more centralized federal role, except in defense-related matters;

8. The current emphasis on state and local self-reliance is particularly true of fiscal responsibilities, as general revenue transfers and other federal-state and federal-local transfers have been eliminated or reduced;

9. The sheer diversity of hazards makes the assessment of risk and the design of emergency management programs difficult (Waugh, 1990).

To be effective emergency management programs must be in place prior to the occurrence of a disaster. Low probability events do not carry great weight in policymaking unless the consequences are so great that they cannot be ignored (Waugh, 1990). However, concerns about legal liability arising out of failure to prepare for known hazards have forced many public officials to pay greater attention to risks to public safety (Waugh, 1990). Nonetheless, there is no single, strong professional organization supporting the development of emergency management standards (Waugh, 1990). Due to the low probability and relative infrequency of most types of disasters, it is difficult to measure the benefits of a strong emergency management program. The ultimate measure of benefit cannot be made until a disaster strikes and even the best efforts may prove inadequate when the magnitude of the disaster exceeds anyone's expectations (Waugh, 1990).

The Process of Terrorism

While terrorist violence poses a risk for nearly everyone in the world, albeit generally without high probability, terrorism continues to remain a major concern for emergency managers and politicians alike. Despite the low probability of becoming involved in a terrorist act, the potential for a large scale destruction and mass causalities strongly suggests that action should be taken to reduce the vulnerability of society to the violence (Waugh, 1990). The continued terrorist threat mandates that emergency managers perform their due diligence and develop strategies to prepare for, mitigate the effects of, respond to, and recover from such events.

The need to prepare for the possibility of a large scale terrorist incident is readily apparent. Communication, transportation, water supplies, and energy generation are delicately structured. Water treatment, energy generation, communication, and transportation facilities tend to be very centralized (Waugh, 1990). Waugh (1990) writes that,

> population centers concentrate civilians and government officials. In short, major disruptions could result from relatively simple acts of violence, if strategically conducted Catastrophic terrorist events are well within the realm of possibility (p. 42).

There are three primary actors in the process of terrorism (1) the terrorist, (2) the victim, be they people, buildings or other inanimate objects, and (3) the targets of the violence, those the terrorist are seeking to influence. The secondary actors are (1) the domestic audience, (2) the international audience, and (3) the government responsible for responding to the violence (Waugh, 1990).

The process of terrorism has six elements:

1. the threat of violence,

2. the violent message to the target group,

3. the political message or action sought from the target group,

4. the broader communication of the threat and political message to audiences and responsible governments,

5. the reaction of the target group to the threat and political message,

6. the response of all audiences to the political conflict between the terrorist and the target.

Response Theories

Plans to deal with terrorist violence typically are categorized as (1) eliminate the cause of the violence, (2) increase the costs of using terrorism, and (3) deny terrorist the benefits they seek (Wilkinson, 1977).

The elimination of the precipitants of terrorist violence may eliminate the desire to inflict pain or injury by the terrorist. Government officials must consider the possibility that the political objectives of the terrorist may be commendable and not antithetical to the existing political order (Wilkinson, 1977). In the long run, a government may find it much less expensive to address legitimate grievances. The trick for the politicians in this scenario is to separate the handling of the grievance from the violent act in an attempt to avoid the appearance that the terrorism has been an effective tool (Waugh, 1990).

Increasing the cost of using terrorism is the most widely used response theory. The first objective is to deny terrorist the opportunity to commit acts of violence

against all targets that they would prefer. It is impossible to secure all targets from terrorist violence, but some targets can be identified as facilities needing fortification.

The second objective is to increase the cost of committing acts of terrorism by forcing terrorist to expend scarce resources (financial, material, and human) on more dangerous acts of violence (Waugh, 1990). Increased security can increase that danger as can actions that make it difficult to use the less expensive forms of violence, such as bombs. Heightened security can also include denying terrorist some resources necessary to carry out their violence, such as strictly regulating access to certain guns, chemicals, and making it difficult for suspected terrorist to travel freely (Waugh, 1990).

The third option, denial of the benefits of terrorism, is the terrorist policy of the United States and Israeli. The edict of "no negotiations, no compromise" is the starting point of these two nations when interacting with terrorist organizations (Waugh, 1990).

According to Waugh (1990),

denial of benefits presupposes that the objectives of the terrorist organization can be identified. Denial of the tactical objectives, usually money, prisoner releases, publicity, and/or safe passage/asylum, can reduce the ability of the organization to operate. Denial of the strategic objectives (publicity, punishment, organizational imperatives, provocation, disruption, and/or instrumental gains) can reduce the effectiveness of the organization. And, denial of the ideological or ultimate objectives of the terrorist may be essential to the preservation of the current regime or order (p. 61).

Emergency Management Model for Terrorism

The potential for mass destruction and mass casualty terrorist events requires that a community attempt to prevent or mitigate the effects of such violence, prepare for the range of problems that might result from a terrorist attack, respond effectively to resolve the immediate crisis caused by the terrorists, to provide emergency support to the victims, and restoring minimum life support systems to assure recovery from the effects of the disaster (Waugh, 1990).

The mitigation function should be viewed as those activities undertaken to prevent terrorist violence altogether. The most successful mitigation efforts typically are focused upon the cultivation of a climate that is hostile to terrorism, thus reducing their opportunity to use violence and increasing the possibility that they will be identified and captured (Waugh, 1990). The methods employed most often in the international setting to achieve this climate are:

1. International treaties that document the flow of money and guns across boarders,

2. Treaties that deny safe havens to terrorist groups,

3. Treaties that make it illegal to provide support for terrorist groups,

4. Treaties that provide for the extradition and subsequent trial of suspected terrorists.

The mitigation functions employed within a country's boarders are geared more towards structural, planning, and engineering changes. Mitigation efforts most often attempted within this realm are:

1. Identifying potential terrorist groups and the potential targets of each individual group;

2. Assess the vulnerability of the potential targets;

3. Provide training to those entities that will most likely respond to a terrorist event;

4. As allowed, reduce or constrain the availability of arms, explosives, and dangerous chemicals;

5. Monitor and control the movement of suspected terrorists across national boarders;

6. Monitor the transfer of large sums of money and the theft of weapons that could be used in a terrorist incident;

7. Secure the most likely terrorist targets to deny terrorists the opportunity to attack particular persons or facilities (Waugh, 1990).

Although this list is not all inclusive, many of the other possible mitigation actions are not in line with the civil liberties we enjoy in this country. Examples of actions that could not be performed on a routine basis would include increasing intelligence operations on terrorist groups, conducting "head counts" to monitor suspected terrorists in their homes, preventive detention, and preemptive strikes against terrorist encampments.

According to Wilkinson (1977),

structural mitigation approaches may include designing buildings to facilitate security, restricting access routes into and out of the building, designing floor plans to accommodate camera surveillance and/or security patrols, and moving difficult to monitor activities away from public areas (p. 194).

The preparedness function for a terrorist event is dependent upon the hazard analysis. Capability assessments, including resource inventories and testing response plans, are the same as any other natural disaster. The major difference between the natural disaster and the terrorist event is defining the exposure. Terrorist will

typically select a target that presents little danger to themselves. Their target will

typically permit easy public access and some opportunity to avoid detection before

and after the attack. Locations such as airports, large cities, large sporting events,

and large resort areas provide this type of access. In addition to public assembly

areas, terrorist attacks can be mounted against public infrastructure items. Power

generation facilities, water distribution and treatment plants, communications

networks, and transportation networks must be considered because of the potential

disruption that might result from a terrorist attack (Waugh, 1990).

McLoughlin (1985) writes that,

> A comprehensive preparedness program for terrorism related risk would
>
> include the development of:
>
> 1. Operational plans to structures that would facilitate the emergency response of
>   police, fire, and emergency management officials that will respond to the event;
>
> 2. An emergency management organization with designated lead agencies,
>   cooperative agreements, and mechanisms for liaison and coordination to carry out
>   the response plan;
>
> 3. A resource management capability to marshal community wide resources at the time
>   of a terrorist event;
>
> 4. Emergency communication networks to tie together the emergency management
>   organization;
>
> 5. Alert and warning systems to make the public aware of the threat and the need to
>   evacuate;

6. Public information channels to keep the public informed so they can avoid the danger;

7. Shelter protection to provide immediate and adequate housing for affected populations during the event;

8. Training and education programs to assure that emergency responders are adequately prepared to respond to a terrorist event;

9. Exercise and drills so that the plans and organizational arrangements can be tested and changed as necessary (p. 168).

Terrorist violence typically does not maintain a considerable visibility factor in the media except in the aftermath of a major terrorist event. While federal offices in Washington, corporate headquarters, and airports have been fortified in resent years, the level of concern for future events has been very uneven. Government building fortification is a usually a result of the federal government's response to the last terrorist event and such measures are not comprehensive and seldom address the larger preparedness, mitigation, and response issues (May, 1985).

Similarities exist between conflicts over interpretations of terrorism and appropriate responses and the scientific and political conflicts over the definition of other types of hazards to the public good. The assessment of hazards of all types are subject to disagreement, particularly to the extent of risk they pose. The debate over the terrorist threat continues and the idea that it is not a serious problem when compared and contrasted against other public health threats remains. According to Waugh (1990),

It is true for Americans that one is more likely to be killed in an automobile

accident on the ride to the airport than killed by a terrorist during the flight. It

is also true that Americans are more likely to die from lightning strikes, shark

attacks, and bathtub accidents (p. 143).

It is for these reasons that an emergency management perspective may be more

appropriate than a more limited view and response. To the extent that a terrorist

action may continue to become more commonplace than it is now, the emergency

management perspective may help institutionalize a set of responses to address the

problem in its multiple forms (Waugh, 1990).

Terrorism and the Emergency Management Perspective

The emergency management perspective is valuable for several reasons. First,

it assumes the threat to be somewhat unpredictable, with tremendous variability in

possible intensity – not unlike a hurricane or earthquake. Scientists continually

attempt to develop better models to predict the size and intensity of hurricanes, but

it is still a prediction process. Because the prediction process is still a science and

not an absolute, emergency manager's preparations must reflect a worst case

scenario.

Second, the emergency management perspective suggests that policies and

programs are designed to be comprehensive. Planning activities should be focused on

a wide variety of activities such as planning for the event, mitigation efforts, response

efforts, and recovery from the effects of a catastrophic terrorist event (Drabek, 1987).

Third, adoption of the perspective may well provide a clearer set of policy

objectives. Typically emergency managers are concerned with minimizing threats to

loss of life and property. While political considerations must be taken into account,

emergency management tends to focus on the routinization of reasonable

precautions and preparations (Drabek, 1987).

Fourth, an emergency management perspective may increase awareness of the

terrorist issue. Awareness is directly related to the frequency of occurrence, having a

broadly focused emergency management effort means that support does not hinge on

the importance that public and public officials place on one particular type of

disaster. The all hazard approach benefits to some extent from any disaster

occurrence (Drabek, 1987).

Finally, the law enforcement focus, in relation to a terrorist event, can become

very one sided – who perpetrated the event. On the other hand, emergency managers

associate successful outcomes of an event with ability to coordinate activities among

a diverse set of agencies without attempting to dictate policy and the ability to

establish and maintain the lines of communications between these entities. The

successful emergency manager is described as a diplomat or mediator, rather than an

authoritarian leader, because of the need to integrate the efforts of multiple agencies

and reconcile the interests of many officials within and outside the government

(Drabek, 1987).

Responding to the Terrorist Threat

Generally, responding to the terrorist threat focuses upon the law enforcement

response to the terrorist themselves. However, a more comprehensive response to

such events should include resolving the crisis if it is continuing, reducing the impact

of the violence on the target, reducing the danger to public health and safety, and

providing immediate care to the injured (Waugh, 1990).

Lewis (1988) writes that,

An emergency response most often is carried out under circumstances that are

characterized by: (1) risk; (2) uncertainty; (3) ambiguity; (4)

competition/conflicts among values; (5) an action orientation; (6) time

constraints; (7) communications limitations; (8) variations in data/information;

and (9) potentially dire and very political consequences (p. 168).

Effective preparedness efforts, including agreements on jurisdiction and joint

action, will reduce coordination problems. It is essential that the requisite time and

effort is placed into the preparedness phase of WMD planning to ensure a unified

response by the public safety community.

Recovering from Terrorist Events

Recovery efforts are usually supported by all facets of the community. In spite

of this, consensus on the need to act can often become clouded during the recovery

phase as political and administrative entities see the potential for gain or loss and

begin pursuing their own self interests rather than a more generalized public good

(Waugh, 1990). The resources required to continue and complete the recovery process

often exceed the capacities of the local community thereby increasing the layers of

bureaucracy by bring in state and Federal officials to assist in the recovery process.

The history of disaster legislation in the U.S. has proven to show that the lesson

learned from how best to respond to a disaster does not transfer well to subsequent

disasters (May, 1986).

The aftermath of disaster is characterized by the assignment of blame, the

assessment of the extent of damage, determining who failed to prepare the

community for the disaster, and whether or not there was an effective response to the disaster. Nevertheless, recovery programs are provided credibility by the disaster. Despite political, economic, and administrative concerns, humanitarian interests demand action (Waugh, 1990).

Creating a Hostile Environment for Terrorist Action

The most common means of creating a hostile environment for terrorist action is to inhibit their activities through legal action. Creating legal vehicles for the apprehension and prosecution of suspected terrorist is extremely effective.

The United States is a signatory of several international conventions that prohibits the unlawful seizure of aircraft and condemns violent acts against civil aviation. These conferences encourage participant nations to prosecute persons who interfere with civil aviation or to extradite them to a nation that will prosecute them (Waugh, 1990).

The Department of Transportation publicizes the names of airports that continually fail security checks and the Secretary of State can issue travel advisories warning the public of unsafe airports. The president ultimately can prohibit U.S. and other airlines serving the U.S. from using these identified airports (Waugh, 1990).

The greatest potential for using law to fight terrorism is perhaps in the application of American law enforcement procedures. Laws have been passed to outlaw the assaulting, maiming, or murdering U.S. citizens overseas. These laws provide law enforcement officials with the ability to reach outside the natural boarders of the U.S. to prosecute terrorists (Emerson 1988).

The Federal Bureau of Investigation (FBI) and other law enforcement agencies

have been very effective in monitoring potentially violent organizations, intervening to stop terrorist operations, and apprehending terrorists. The ability to closely track the activities of these groups severely inhibits the terrorist threat. The combination of increased border security, international antiterrorism agreements, specific legislation proscribing economic and political ties to identified terrorist nations, efforts to interdict shipments of weapons and other terrorist activities have acted to isolate terrorist from possible international support (Waugh, 1990).

American Terrorist Policy

According to Farrell (1983),

The official U.S. policy regarding terrorist demands is to offer no concessions. The origins of that policy are traced to statements made by President Nixon in 1970 when the Saudi Arabian embassy in Khartoum, Sudan was seized by members of the Black September Organization. Soon after the initial statement, two American diplomats were killed. The logic of the policy is that concessions will only lead to more violence (p. 59).

The validity of that position was called into question during the Regan Administration's attempt to trade arms to Iran in exchange for American hostages held in Lebanon.

The contemporary U.S. terrorist policy is based upon three elements: (1) not acceding to terrorist demands, (2) identifying and punishing states that support terrorism, and (3) using the force of law to apprehend, try, and punish terrorists. The policy is intended to take a proactive stance, emphasizing the need for offensive counterterrorism programs rather than more defensive antiterrorism efforts (Morris,

1988).

Interventions in the terrorist process clearly indicate that American policy address the need for preparedness. Nevertheless, some agencies exhibit very high levels of preparedness and others very low. The highest risk facilities within a community must first be identified and then they should be secured. The great number of potential targets across the nation suggests that providing security to all would be prohibitively expensive. That is undoubtedly the reasoning behind the current emphasis on counterterrorism programs in the U.S. today (Waugh, 1990).

Classifications of Weapons of Mass Destruction

Weapons of mass destruction can be classified by their basis type (biological, chemical, or radiological), their effects on people, and their delivery systems. Each type of weapon requires special expertise to recognize, design, build, or handle the material; all three impose special risk to the handlers. The effectiveness of a weapon of mass destruction is effected by the weather, terrain, building construction, and effectiveness of security measures in place (Ellis, 1999).

Technological Barriers to Weapons of Mass Destruction

In order for the terrorist to deploy a weapon of mass destruction (WMD), there are many barriers that must first be overcome. Technological barriers are obstacles that a group must surmount in order to use a nuclear, biological, or chemical agent as a WMD.

A biological agent can theoretically be created in the terrorist's own garage if the conditions are correct. The obstacles that the terrorist group must address to end up with a viable WMD include:

- obtaining the pathogen. This action in and amongst itself can draw attention to the individuals seeking the raw materials,

- a containment area maintaining optimal growth temperatures and medium must be constructed. Workers in this biological lab must maintain high level protection using high quality personal protective equipment,

- within the lab, highly skilled workers would be required to cultivate and maintain the organism in sufficient quantity to be deployed in a weapon,

- a dispersal system must be constructed or bought for product delivery,

- the terrorist must deliver the WMD to the target site. (Bevelacqua, 1998).

Once released, the WMD could induce uncontrollable effects on a population, resulting in an epidemic or wide spread panic. The result of this hypothetical confusion could lead to the accidental or intentional death of the terrorist themselves. The goal of the terrorist is to destroy the public's faith in the government's ability to protect its citizens. If this goal is obtained, the result will be distrust of the government and sympathy towards the terrorist's philosophy (Bevelacqua, 1998).

Chemical Agents

Chemical agents that are used to harm or kill innocent persons are inhumane, unjust, barbaric, and cruel. Nonetheless, world military organizations have used chemical weapons since before World War I. Since that time, some chemical agents have remained the same and some others have changed drastically to increase their potency. Because terrorists learn from the military, first responders should understand chemical agents used by military organizations (Bevelacqua, 1998).

Chemical weapons are classified in military terms describing their effect on the enemy. The intention of a chemical weapon is to incapacitate or kill the recipient. Chemical weapons are divided into the following groups:

- Nerve agents (neurotoxins),

- Respiratory agents (choking agents),

- Chemical asphyxiants (blood agents),

- Skin irritants (blister agents),

- Antipersonnel agents (riot control).

Nerve agents are the most common chemical agent selected for use in wartime activity. These agents are very effective because they can enter the body through virtually any route and cause incapacitation and death. Nerve agents have been formulated to be extremely toxic to the intended victim, but break down rapidly so that invading forces can inhabit the area within days after the chemical attack. Similar compounds used in civilian society are organophosphates pesticides; some with extremely toxic qualities. Terrorist may choose to use commonly found pesticides and still obtain devastating effects (Bevelacqua, 1998).

Respiratory agents have long been used by the military during war time. During World War I the military used both chlorine and phosgene gas as a chemical weapon. Many communities today use chlorine gas to chlorinate drinking water and swimming pools. Chlorine gas can also be used as a antimold and fungicide agent. Chlorine gas is readily available on the commercial market.

Choking agents are typically stored as liquids, but rapidly becomes gas once released from its container. These chemical agents were used on the battlefield to

incacitate the enemy, so that it could be overrun by advancing troops. This tactic worked well because these agents disperse rapidly into the environment, leaving no contaminated objects behind.

Once exposed, victims are overcome with severe, uncontrollable coughing, gagging, and tightness in the chest. Bronchospasms and laryngeal spasms are common, causing apnea and unconsciousness (Bevelacqua, 1998).

The most common chemical asphyxiant is cyanide. Cyanide is used in industry for heat treating and plating, fumigation, and chemical synthesis in the production of plastic. Cyanide acts in two ways, (1) it inhibits the hemoglobin's ability to carry oxygen, and (2) it interferes with the cell's ability to use oxygen. Because of its wide spread use in industry, cyanide can be readily obtained by terrorists groups (Bevelacqua, 1998).

Blister agents were originally developed by the military because enemy troops could protect themselves from respiratory agents with masks. According to Bevelacqua (1998),

Three types of blister agents are primarily used by the military. These agents include mustard, phosgene, and lewisite. For the most part, the agents are liquids that vaporize slowly causing an inhalation hazard. Skin and eye exposure is the most common effect that results from direct contact with the liquid. Strong irritants, these agents are capable of causing extreme pain and large blisters on contact. If the vapors are inhaled, the lung tissue will form large obstructing blisters. Once the blisters break, a large open wound results that allows the establishment of overwhelming infections, a condition that will

cause death (p. 34).

Riot control agents are used to incapacitate individuals and make them unable to function. They are not intended to cause mortal injury and have only rarely caused severe lasting injury. Chemical antipersonnel weapons have gained popularity with both the general public and law enforcement, because they subdue persons without the use of extraordinary force. The effects of riot control agents begin in 1-3 seconds and are characterized by extreme irritation to the eyes, causing burning and tearing. Irritation to the skin is also common, because the crystals stick to moist skin, causing burning and itching at the point of contact. The effect of riot control agents last for 10-30 minutes (Bevelacqua, 1998). These agents are sold over-the-counter and therefore readily available to terrorists.

Biological Agents

Bevelacqua (1998) writes that,

The thought of being infected by a deadly disease or poisoned by a biological toxin is truly frightening. This fear may stimulate a terrorist to choose a biological weapon. Unfortunately, these agents are not difficult to cultivate; they are surprisingly easy for someone with a very limited knowledge of microbiology to produce (p. 41).

Biological agents are made from a variety of microorganisms and biological toxins. Biological toxins are chemical compounds poisonous to humans produced by plant, animal, or microbes. Microorganisms are generally living viruses or bacteria that have the ability to establish deadly infections in their victims. Many of these organisms are recognized as military type weapons, many others can be cultivated

and introduced at a target site with the intention of inflicting harm on a civilian population (Bevelacqua, 1998).

Bacteria are single celled microorganisms plant like in structure. Examples of bacterial agents are: (1) anthrax, (2) plague, (3) Q fever, and (4) salmonellae. These microorganisms can be grown in artificial media; many have the ability to spore or become seed like and live for long periods of time before infecting someone (Bevelacqua, 1998).

Viruses are smaller than bacteria and survive on or within other cells, using the host cells' machinery for metabolism. Viruses can not be cultivated in an artificial media, but only in a media that contain living host cells. According to Bevelacqua (1998),

> Each virus needs a particular type of host cell, making the production of viruses for terrorism complicated and expensive. For this reason, it is probably unlikely that low budget organizations would use viruses to inflict harm on a target population (p. 42).

Example of viruses that might be used in a small scale terrorist operation would include smallpox, encephalitis, and hemorrhagic fever.

Biological toxins are toxic substances originating in animals or plants. The typically terrorist application of these agents would be a small scale contamination of food sources, water supplies, and specific targeted individuals. Examples of theses agents would be botulism and ricin (Bevelacqua, 1998).

Nuclear Terrorism

There are two different types of nuclear terrorist threats (1) a reactive attack

which includes a thermonuclear detonation, and (2) a dirty nuclear bomb. In the first form the radioactive material is used to produce fusion chain reaction. Typically, the radioactive material is forced together under great pressure to create a critical mass causing a split (fission) which gives off intense heat. This intense heat results in both widespread death and destruction.

The second bomb, a dirty bomb, is where the radioactive material is simply used as a hazardous substance, independent of the bomb, to directly contaminate an area or its people. A radioactive source is attached to a explosive devise and the radiation given off by the material when the bomb explodes effects the people exposed (Ellis, 1999). The delivery system for a dirty bomb can be any explosive devise from approximately hand grenade size up through the truck bomb size.

Accordingly Bevelacqua (1998) writes that, "with the recent fall of the Communist government in Russia, it would seem plausible that a terrorist group might obtain a thermonuclear device" (p. 55). Black market uranium and plutonium in small amounts have already been found and will probably become more available in the future and the technology to produce a thermonuclear device has also become easier to obtain (Bevelacqua, 1998). It is widely held that the terrorist threat from a thermonuclear device is likely and many experts agree that it is only a matter of time before a terrorist group will buy, steal, or build a nuclear device capable of harming a large group of people.

Conversely, the extreme expense to acquire a thermonuclear device, its inherent logistical difficulties, and the enormous amount of technology necessary to develop and deploy such a device make it improbable that a unsophisticated terrorist

organization could successfully deploy such a weapon (Shultz, 1980). Unless a terrorist organization has state sponsorship, it is unlikely to have any delivery system other than a person, simple land vehicle, boat, or light aircraft. This limits the delivery considerably in a number of ways since the components for a nuclear device are heavy due to the internal precision and shielding requirements. The weight carrying restrictions of the delivery system becomes the critical limitation.

The effects of radiological weapons are always the same, varying only by the type, longevity or intensity of the exposure to the weapon's radiation effects (Ellis, 1999). The biological effects of radiation devices inflict injury upon the body in three ways. These three mechanisms of injury result from the sequence of events that occur in a nuclear detonation at or near the earth's surface (Ellis, 1999).

The first mechanism is the extreme heat from the nuclear reaction. It will account for about 35 percent of the casualties caused by the detonation. The burns resulting from the blast may vary from mild reddening to literally reducing a person to ashes dependent upon the yield of the device, the distance from ground zero, and the persons exposure (Ellis, 1999).

Blast effects are the second mechanism of injury creating most of the casualties (50%). The pressure wave itself causes direct injuries by exerting pressure on the body which exceeds its tolerance. The pressure wave travels outward with a shock velocity that hurls objects and people through the air and causing direct impact injuries to people by projectiles or collisions with hard objects. The severity of the injuries produced is dependent upon the level of the overpressure, the velocity of the wave, and the natural shielding that a person has at the time of the blast (Ellis, 1999).

The third mechanism of injury is radiation exposure. Initial radiation from a nuclear detonation produces about 5 percent of all casualties, while prolonged exposure to radiation accounts for the remaining 10 percent of casualties (Ellis, 1999).

Ellis (1999) writes that,

Alpha and Beta particles cause radiation by direct contact on skin, inhalation, ingestion, or injection. These particles continue to cause problems as long as they are in contact with any part of the body or until they decay into a stable, non-radioactive element. Gamma rays cause radiation injury by passing through the tissue and causing biological changes as they pass through the body. Bones and certain internal organs are the areas that are most affected. Regardless of the type of radiation, all effects are cumulative on the body. The usual symptoms of radiation poisoning are edema, hair loss, nausea, vomiting, and weakness (p. 68).

Once a person is exposed to radiation the biological effects are not reversible; once exposed, always exposed. The final technical point to make about radiation is that it is not neutralized by decontamination. When a person is decontaminated the radioactive material is simply moved from that person to another location. The radiation still exists and will continue to exist until it naturally decays into a stable element (Ellis, 1999).

Vulnerability Assessment for Weapons of Mass Destruction

The point of the vulnerability assessment is to apply the specific risk to a specific target location. The most important part of the vulnerability assessment is that weapons of mass destruction are predominantly anti-personnel weapons and

have little effect upon the structures present (except with thermonuclear detonations). The vulnerability assessment centers around three primary factors: the criticality of the site, the terrain around the site, and the physical security of the site (Ellis, 1999).

The terrorist's intent with the detonation of a thermonuclear device is strictly a strategic strike. The results of a detonation are so vast for any nuclear weapon that a terrorist group cannot possibly capitalize upon the immediate tactical benefit. The terrorist can not occupy the blast area after the detonation of a nuclear devise as he could with the deployment of a rapidly dissipating chemical or biological agent. The terrorist is forced to stay clear of the area as all others are.

WMD Threat Assessment Process

The terrorist's primary objective in deploying a WMD is that the agent must get to the intended victims. The agent must get to the intended victims by touch (surfaces or air), by taste (food or water), or by smell (air). To reach inside the facility to effect the victims the WMD will have to travel through ventilation systems, be transported by infected food products, via water outputs (water fountains, bathrooms), or objects containing the WMD that are physically carried into the facility (Threat, 1999).

Among the principle means to reduce a facilities vulnerability to a WMD attack are effective building codes. Code requirements pertaining to positive pressure ventilation systems that are used during fires that are designed to contain smoke within certain effected areas of the structure can also be utilized to contain a WMD deployment. The ability to filter, reroute, divert or isolate certain sections of a

structure from non-effected areas in essential to minimizing the effects of a WMD attack inside a facility (Ellis, 1999).

The design of a facilities utility systems (water, gas and sewer pipe) should also reflect this same compartmentalization concept. This design would be effective if the terrorist attempted to mount their attack through the pipes of a facility (Ellis, 1999). Items that should be assessed in relation to a WMD deployment vis-à-vis the utility infrastructure are a terrorist's ability to access:

- the ventilation system intakes,

- the buildings electrical conduits

- telephone conduits,

- cafeteria food building intake,

- water system building intake,

- public restrooms within the building.

Facility physical security issues must also be considered. According to Threat & Risk Assessment (1999), the facility should provide for:

- the ability to control public access,

- exterior traffic barriers,

- parking more than 200 feet from the building,

- monitored waiting areas,

- monitored key and lock controls

- controls to monitor trash disposal,

- mail inspection,

- secured storage areas, and

- hand carried item inspection (p. 8).

Vulnerability and Chemical Weapons

Site vulnerability analysis begins with the usual considerations of its criticality. Certain operations will be more favorable for chemical weapons as compared to biological or nuclear events. According the Ellis (1999),

> Corporation headquarters' offices, mass transit facilities governmental offices or similar operations where important functions are located along with concentrations of personnel who perform them fit into this category well. Chemical weapons, with their capacity to easily kill or disrupt operations, are an excellent choice for enclosed operations of this type (p. 76).

Cities tend to have accessible chemicals and production areas to assist manufacturing of the weapon and nearby personnel concentrations that are vulnerable to attack. Heavy movement of the population is typical in the cities and this movement disguises the staging of the weapon to its target site.

Other positive attributes the terrorist may attempt to take advantage of are local weather conditions. Regions that are subject to temperature inversions are preferred for chemical attacks because the inversion tends to hold a chemical attack on the ground longer so that the effect on the population is prolonged. Hilltops, areas with high humidity, strong winds, and extreme temperatures tend to be unfavorable for attack (Ellis, 1999).

The physical system of the site will make some difference in unusual ways. The typical evaluations of the physical security to control access must be made, but also specific evaluations of the utilities and alarm functions as well. Water, sewer, gas,

and air ventilation systems all provide possible entry points for a chemical agent. Their accessibility must be specifically examined and the ability to disperse an agent throughout the structure must be assessed. This assessment is critical as utilities usually provide the easiest avenue of entry into a structure, and are not usually monitored (Ellis, 1999).

The alarm system should be assessed to determine if it has the capability to detect foreign chemicals within the structure. Ellis (1999) writes that, "the alarm system should have some monitoring capability of the utilities since introduction of chemical agents via these routes can be expected to disrupt the normal service or at least cause it to vary" (p. 78).

Vulnerability and Biological Weapons

As with chemical weapons, biological weapons, with their ability to kill or disrupt operations by illness, are a good choice for enclosed space operations like office buildings, mass transit facilities, and crowded public gathering places. Neglected areas of large cities provide good opportunities for use of biological agents as they tend to disguise the attack (Ellis, 1999).

Insofar as weather conditions are concerned with biological attacks, extreme ambient temperatures generally will be unfavorable to biological agent attacks as these conditions tend to kill the agent. However, the same extremes tend to lower the populations resistance to any disease. The extent of public health operations in the area is also important. This includes immunizations programs for people and animals (Ellis, 1999). A community with a large percentage of their population immunized stands a better chance of warding off infection.

Ventilation systems, water, sewer, and gas distribution systems within a structure all serve as excellent conduits for biological agents. Agents in a liquid or aerosol form can easily be dispersed throughout a building causing widespread contamination.

Defensive Actions Against Weapons of Mass Destruction

Weapons of mass destruction have common mechanisms of damage. All are dependent upon personal exposure to a contaminant which may enter the body in limited ways. The means of entry are ingestion, inhalation, injection, or absorption. The defensive goal for the emergency management community when dealing with weapons of mass destruction are to prevent the ingestion, inhalation, injection, and absorption of the destructive agent involved and create a survival zone for the people that are present at the time of the attack (Ellis, 1999). According to Ellis (1999),

the supporting tasks for defense against a WMD can be stated as (1) monitor the site and surrounding area for emplacement of the device by the terrorist, (2) establish a denial perimeter which creates collective survival zones and plans for individual survival measures (p.134).

PROCEDURES

Definition of Terms

Terrorism. Is the unlawful use of force or violence against persons or property

to intimidate or coerce a government, the civilian population, or any segment thereof,

in furtherance of political or social objectives.

Chemical Agents. Neurotoxins, chemical asphyxiants, respiratory irritants, skin

irritants, and riot control compounds that are designed to incapacitate or kill human

life.

Biological Agents. Microorganisms and biological toxins that are poisonous to

humans produced by plants, animals, or microbes.

Dirty Bomb. An explosive dispersion devise with a conventional explosive

weapon wrapped or impregnated with radioactive material, the release of which is

intended to contaminate an area or population.

Thermonuclear Device. A weapon which releases nuclear energy in an explosive

manner as the result of a chain reaction involving fission and fusion.

Research Methodology

The desired outcome of this research was to create a Weapons of Mass

Destruction Site Survey for the company officer to complete on structures and

facilities within his/her territory.

The research was action research in that the information gathered for the

Literature Review was applied to the actual problem of identifying the vulnerability of

facilities and structures to weapons of mass destruction. This information was

embodied in Appendix C as a new Weapons of Mass Destruction Site Survey.

Assumptions and Limitations

This new tool for the company officer is only as good as the training the officer receives as he/she tries to apply it. During the author's 19 year tenure with the Orlando Fire Department, there hasn't been a training class offered on the topic of how to effectively evaluate the vulnerability of facilities and structures within the city. This project is meant to fill this void. The comprehensive literature review was designed to enlighten those officers with a desire to learn what the key components are relating to assessing the vulnerability of facilities and structures against a weapon of mass destruction deployment.

It is hoped that the information contained herein will be read, discussed, and scrutinized by chief and company officers alike. It is only through this educational process that both sides can learn and grow to develop a better understanding of what a weapons of mass destruction vulnerability assessment is all about.

Survey: Definition of Population

A survey of 100 fire departments was conducted to analyze the different methods of contemporary vulnerability assessment currently used in the fire service today. The purpose of the survey was to quantify the number of departments, both locally and nationally, that (1) train their work force on the fundamentals of weapons of mass destruction events, (2) conduct or obtain an assessment of the vulnerability of the critical facilities and systems within a community, and (3) provide guidance or suggestions to property owners on the technical, planning, operational, and/or possible facilities improvement issues regarding a weapons of mass destruction incident at their location.

Population of the Survey

The population of the survey included 100 fire departments from across the nation. These 100 departments were selected from the class rosters of all four National Fire Academy Executive Fire Officer classes that the author has taken. These departments provided an excellent cross section of both large and small communities. Appendix D contains a list of the departments the surveys were mailed to.

Collection of Data

There were 83 surveys returned of the 100 sent out for a 83% response rate.

Weapons of Mass Destruction Site Survey

The results of the survey and the data obtained for the Literature Review were utilized to construct a Weapons of Mass Destruction Site Survey that appears in Appendix B. Each attribute on the form was selected from the survey responses and the Literature Review based upon its relevance to the subject of WMD vulnerability assessment.

RESULTS

Answers to Research Questions

Research Question 1. The two main attributes that drives the terrorist's selection of a particular facility or structure within a community as a deployment site for a WMD are: motivational issues and physical security issues. The motivational issues that drive a selection are: the significance of the name of the facility or structure (Federal Courthouse), the significance of the date of the event (anniversary

of the Waco, TX incident), the area surrounding the target site, and the political significance of the target (Lincoln Memorial). The physical security of a facility or structure depicts the level of difficulty the terrorist will experience trying to deploy a WMD. So the answer to Question 1of the items to include is in Appendix C.

Research Question 2. The three different types of weapons of mass destruction are chemical, biological, and nuclear weapons. Chemical weapons have the ability to focus on killing people while having minimal impact on the structures and buildings where it is used. Chemicals agents are classified in terms describing their effect on bodily system, such as neurotoxins, chemical asphyxiants, riot control agents, and skin irritants.

Microorganisms and biological toxins are used to make biological weapons. Chemical compounds that are naturally produced by some plants, animals, and microbes that are poisonous to the human body, are know as biological toxins. Terrorist can cultivate certain viruses and bacteria, that when deployed, can cause deadly infections in a population.

Nuclear weapons are classified in two ways. The first device is called a thermonuclear device. In a thermonuclear device, radioactive material is forced together under great pressure to create a critical mass that splits and gives off intense heat. The subsequent heat from the reaction produces widespread destruction in the area surrounding the blast site. The second radiological event is the dirty bomb. The dirty bomb is radioactive material that is placed outside of a conventional weapon so that when this weapon detonates, the radioactive material is dispersed as part of the blast wave. The blast area is then contaminated with the

residual radioactive material.

Research Question 3. The emergency management model represents the most comprehensive approach to consequence management of a weapons of mass destruction event. The reason the model can be adapted so well to the terrorist threat is due to its four phase approach. The first phase of the emergency management model is mitigation. Mitigation is the process of deciding, before the incident occurs, what to do where a risk to the health and safety of a community has been determined to exist; and then implementing a risk reduction program to reduce the effects of the identified risks.

Preparedness is a process whereby communities (1) develop detailed mutual aid agreements committing resources to one another if a WMD event were to occur, (2) provides training to its citizenry to assist in the aftermath of a terrorist event, and (3) identify resources that will be needed in times of crisis. The time to develop these arrangements, identify shortcomings, and provide the training programs is well before the incident occurs.

The emergency management model provides for a response mode during the disaster. The response mode should be centered around providing emergency first aid to victims of the disaster, containment of the terrorist threat, reassurance of the target group, and reducing ancillary damage from the event.

The recovery mode of the emergency management model provides for the types of activities that must take place to resume some sense of normalcy within the community. The recovery mode will encompass the restoration of electrical power if interrupted, debris management from the event, and psychological support to the

victims within community.

Research Question 4. Because the common perception exists that it is unlikely that a terrorist event will occur within a particular community is pervasive, it can be difficult to secure the requisite funding to mitigate and plan for these events. Albeit the case, emergency managers must continually exercise their due diligence to ensure that this topic is discussed and acknowledged in recurring public forums.

 Politicians are typically adverse to providing the staunch support that many mitigation efforts require within a community. Without a clear, well defined threat, city fathers are unlikely to pursue legislation that requires additional dollars be spent on private and public projects to reduce the terrorist threat within a community.

Research Question 5. The current mind set, according to the results of the survey done for this project, clearly indicates that most fire departments do not assist other governmental subdivision and property owners, within their own communities, on the steps necessary to reduce the vulnerability of their facility or structure to a terrorist threat.

Fire departments across the nation are uniquely situated to perform a WMD site survey on the facilities within their communities. By identifying potential weaknesses in their physical security, company officers can assist property owners in enhancing and augmenting the deterrent effects of existing facilities against terrorist action.

Results of the Survey

Out of the 100 fire departments surveyed, Appendix B reflects that over 80% of the respondents do not provide any WMD awareness training to their personnel (Question 1).

The survey showed that 90% of respondents do not provide a WMD site survey to property owners within their communities. This statistic reflects that an overwhelming percentage of departments do not see the vulnerability assessment of a WMD threat in their community as a pressing issue (Question 3). Question 4 goes on to depict that another 94% of respondents do not currently conduct an assessment of the vulnerability of its own computer network, telecommunications system, and/or Internet services to a cyber attack.

When asked if their community's public health system (fire department emergency medical services, private ambulance contractor, Health Department, etc.) has developed and/or adapted existing plans or procedures to provide assistance and services to victims within an area impacted by a weapon of mass destruction over 91% of respondents answered that they had not (Question 6).

Another overwhelming statistic is the percentage of communities that have not developed nor provided guidance for specialized shelter operations that may be required by a weapon of mass destruction attack, such as medical monitoring, decontamination, and first aid for victims. Approximately 85% of the departments surveyed do not provide this function within their communities (Question 7).

According to the survey, most departments have not participated in any functional or table top exercises with other entities that will work along side of their department during an event involving of a weapon of mass destruction attack. Nearly 67% of the departments surveyed have not participated in any functional or table top exercises relating directly to a WMD incident (Question 8).

When asked if the department has evaluated existing hazardous materials

response procedures, protocols, and equipment used by their department for their effectiveness during a weapon of mass destruction event, 59% responded that their department has not done so (Question 10).

Question 12 noted that nearly 95% of respondents stated that their department does not provide guidance or suggestions to property owners on the technical, planning, operational, and/or possible facilities improvement issues regarding possible WMD incidents at the property owners location.

Unexpected Findings

An interesting unexpected finding from the survey was the fact that many departments do not provide any WMD awareness training to their front line personnel. Nearly 67% of respondents have not participated in any functional or table top WMD exercises with other entities within or outside of their prospective jurisdictions. Additionally, only 10% of the respondents had a WMD site survey or any assimilation thereof, developed and in use for their community. The fact that 91% of responding departments did not consider the sheltering and emergency medical care issues regarding the victims of a WMD attack was an unexpected finding.

Weapons of Mass Destruction Site Survey Form

Based upon a review of the literature, the Weapons of Mass Destruction Site Survey Form was created. This new form is included as Appendix C.

This multiple page form provides a place for the name of the occupancy, street address, date of the survey, and the surveyors name. Additionally, there are instructions as to how to complete the form. The evaluation section of the form outlines 40 different attributes that the surveyor scores on a scale of 1 through 5.

A score of 1 represents a areas of little concern whereas a score of 5 represents an area of great concern on a sliding scale. Upon completion of the survey, a total score for the facility is derived by totaling the score of each individual attribute.

Each time a company officer performs a fire safety company inspection at a facility or building within his/her territory a WMD site survey will be conducted. All facilities or buildings obtaining a score of 125 or greater will be referred to the Orlando Fire Department Hazardous Materials Team. Once the hazardous materials team receives the completed survey reflecting a score of 125 or more they will schedule an appointment with the property owner to discuss possible WMD mitigation efforts that can be employed at the facility or building.

DISCUSSION

The Weapons of Mass Destruction Site Survey Form, which represents the results of this research, embodies the focus of the emergency management process outlined by Waugh in 1990. The efforts to control a WMD incident within a community are predicated upon a communitie's preparedness, mitigation efforts, ability to respond effectively, and to quickly recover from the incident.

Weapons of mass destruction preparedness is the process of identifying the weakness that exists in communities insofar as terrorists attacks are concerned. Once these weaknesses are identified mitigation efforts such as denial of the opportunity to attack, isolation of terrorists from their supporters, and reducing the terrorists opportunities to attack can take place. Those facilities or buildings that score a 125 or more will be referred to the hazardous materials team so that a follow up visit can

be scheduled to discuss what can be done to fortify the property. According to Waugh

(1990), "preparedness and mitigation have the potential of preventing the terrorist

violence altogether" (p. 76). Preparedness and mitigation can also foster an

atmosphere that is hostile to terrorists, thus reducing their opportunity to use

violence and increasing the likelihood that they will be identified and captured

(Waugh, 1999).

Because this new site survey is untested and based upon a synthesis of

information gathered in this research, a testing period should be invoked to

determine its applicability. This is new ground for our department and there will be

an associated learning curve with this new site survey process.

The Weapons of Mass Destruction Site Survey Form is the first for the Orlando

Fire Department. This author hopes that the company officers within our department

will take the time and effort to review the important points depicted in the Literature

Review on how to potentially reduce a communities vulnerability to a WMD attack.

This subject matter hasn't been addressed before by the department so self

motivation to become familiar with this information is necessary. This study has

hopefully produced an instrument that will advance the job performance of not only

the company officer, but of each uniformed member of the Orlando Fire Department and thus

further the safety of our citizens.

RECOMMENDATIONS

The Weapons of Mass Destruction Site Survey must contain an educational component. OFD should integrate use of this survey in its ongoing training and assure that WMD threat assessment is ingrained in both company officers and managers alike. Written instruction explaining the use of the form should be more fully developed.

The information obtained for completed WMD site surveys could be added to a data base. The city should work with Information Systems (computer department within the city) to develop an information retrieval system accessible to appropriate managers at their desk top computers. This information may be useful when trying to determine which mitigation efforts have been used at other facilities or buildings in the past so that informed recommendation can be made to property owners in the future.

Periodic review of the form should take place to ensure contemporary views on terrorist threat assessment are incorporated within the form. New ideas based on the latest research will continue to improve this vehicle. As the form matures and evolves through training, review, and revision, OFD should offer to assist neighboring departments with WMD assessments within their jurisdictions. Once all company officers have received training on the WMD Site Survey Form similar training should be provided to the remainder of departmental personnel.

The score of 125 may need to be re-examined. Many will argue that some of the attributes are infinitely more important than others on the list. Perhaps a weighting factor can be attached to each attribute to better signify the importance of one

attribute as compared and contrasted against another. Upon completion of that task, the survey scoring system can be changed.

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